

# SEQUENCE LISTING

<110> FUKUCHI, Naoyuki  
 FUTAKI, Fumie  
 KITO, Morikazu  
 SATO, Seiichi  
 KAJIURA, Takayuki  
 ONO, Yukitsugu  
 TANAKA,, Akiko  
 SHINOZAKI, Junko

<120> Substance with Antithrombic Activity and Method for Detecting  
 Glycocalicin

<130> 198804US0PCT

<140> US 09/673,245

<141> 2000-10-23

<150> PCT/JP99/00089

<151> 1998-01-13

<150> JP 10-113962

<151> 1998-04-23

<160> 14

<170> PatentIn version 3.1

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Val Ser Ser Val Phe Ile Phe Pro Pro Lys Pro Lys Asp Val Leu Thr		
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att act ctg act cct aag gtc acg tgt gtt gtg gta gac atc agc aag		144
Ile Thr Leu Thr Pro Lys Val Thr Cys Val Val Val Asp Ile Ser Lys		
35 40 45		
gat gat ccc gag gtc cag ttc agc tgg ttt gta gat gat gtg gag gtg		192
Asp Asp Pro Glu Val Gln Phe Ser Trp Phe Val Asp Asp Val Glu Val		
50 55 60		
cac aca gct cag acg caa ccc cgg gag gag cag ttc aac agc act ttc		240
His Thr Ala Gln Thr Gln Pro Arg Glu Glu Gln Phe Asn Ser Thr Phe		
65 70 75 80		
cgc tca gtc agt gaa ctt ccc atc atg cac cag gac tgg ctc aat ggc		288
Arg Ser Val Ser Glu Leu Pro Ile Met His Gln Asp Trp Leu Asn Gly		
85 90 95		
aag gag ttc aaa tgc agg gta aac agt gca gct ttc cct gcc ccc atc		336
Lys Glu Phe Lys Cys Arg Val Asn Ser Ala Ala Phe Pro Ala Pro Ile		
100 105 110		
gag aaa acc atc tcc aaa acc aaa ggc aga ccg aag gct cca cag gtg		384
Glu Lys Thr Ile Ser Lys Thr Lys Gly Arg Pro Lys Ala Pro Gln Val		
115 120 125		
tac acc att cca cct ccc aag gag cag atg gcc aag gat aaa gtc agt		432
Tyr Thr Ile Pro Pro Pro Lys Glu Gln Met Ala Lys Asp Lys Val Ser		
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ctg acc tgc atg ata aca gac ttc ttc cct gaa gac att act gtg gag		480



Glu Lys Thr Ile Ser Lys Thr Lys Gly Arg Pro Lys Ala Pro Gln Val  
 115 120 125

Tyr Thr Ile Pro Pro Pro Lys Glu Gln Met Ala Lys Asp Lys Val Ser  
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Leu Thr Cys Met Ile Thr Asp Phe Phe Pro Glu Asp Ile Thr Val Glu  
 145 150 155 160

Trp Gln Trp Asn Gly Gln Pro Ala Glu Asn Tyr Lys Asn Thr Gln Pro  
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Gln Lys Ser Asn Trp Glu Ala Gly Asn Thr Phe Thr Cys Ser Val Leu  
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Cys Asp Lys Arg Asn Leu Thr Ala Leu Pro Pro Asp Leu Pro Lys Asp	
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Thr Thr Ile Leu His Leu Ser Glu Asn Leu Leu Tyr Thr Phe Ser Leu	
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tgc gag ctc acc aag ctc cag gtc gat ggg acg ctg cca gtg ctg ggg	288
Cys Glu Leu Thr Lys Leu Gln Val Asp Gly Thr Leu Pro Val Leu Gly	
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Thr Leu Asp Leu Ser His Asn Gln Leu Gln Ser Leu Pro Leu Leu Gly	
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cag aca ctg cct gct ctc acc gtc ctg gac gtc tcc ttc aac cgg ctg	384
Gln Thr Leu Pro Ala Leu Thr Val Leu Asp Val Ser Phe Asn Arg Leu	
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acc tcg ctg cct ctt ggt gcc ctg cgt ggt ctt ggc gaa ctc caa gag	432
Thr Ser Leu Pro Leu Gly Ala Leu Arg Gly Leu Gly Glu Leu Gln Glu	
115 120 125	
ctc tac ctg aaa ggc aat gag ctg aag acc ctg ccc cca ggg ctc ctg	480
Leu Tyr Leu Lys Gly Asn Glu Leu Lys Thr Leu Pro Pro Gly Leu Leu	
130 135 140	
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Thr Pro Thr Pro Lys Leu Glu Lys Leu Ser Leu Ala Asn Asn Asn Leu	
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Thr Glu Leu Pro Ala Gly Leu Leu Asn Gly Leu Glu Asn Leu Asp Thr	
165 170 175	
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Leu Leu Leu Gln Glu Asn Ser Leu Tyr Thr Ile Pro Lys Gly Phe Phe	
180 185 190	
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Cys Asn Cys Glu Ile Leu Tyr Phe Arg Arg Trp Leu Gln Asp Asn Ala	
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Glu Asn Val Tyr Val Trp Lys Gln Gly Val Asp Val Lys Ala Met Thr	
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Ser Asn Val Ala Ser Val Gln Cys Asp Asn Ser Asp Lys Phe Pro Val	
245 250 255	
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Tyr Lys Tyr Pro Gly Lys Gly Cys Pro Thr Leu Gly Asp Glu Gly Asp	
260 265 270	
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Thr Asp Leu Tyr Asp Tyr Tyr Pro Glu Glu Asp Thr Glu Gly Asp Lys	
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Val Arg Ala Thr Arg Thr Val Val Lys Phe Pro Thr Lys Ala His Thr	
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370 375 380	
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Thr Ala Gln Thr Gln Pro Arg Glu Glu Gln Phe Asn Ser Thr Phe Arg	
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tca gtc agt gaa ctt ccc atc atg cac cag gac tgg ctc aat ggc aag	1296
Ser Val Ser Glu Leu Pro Ile Met His Gln Asp Trp Leu Asn Gly Lys	
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Thr Ile Pro Pro Pro Lys Glu Gln Met Ala Lys Asp Lys Val Ser Leu			
450	455	460	
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485	490	495	
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Lys Ser Asn Trp Glu Ala Gly Asn Thr Phe Thr Cys Ser Val Leu His			
515	520	525	
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Cys Glu Leu Thr Lys Leu Gln Val Asp Gly Thr Leu Pro Val Leu Gly  
 65 70 75 80

Thr Leu Asp Leu Ser His Asn Gln Leu Gln Ser Leu Pro Leu Leu Gly  
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Gln Thr Leu Pro Ala Leu Thr Val Leu Asp Val Ser Phe Asn Arg Leu  
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Thr Ser Leu Pro Leu Gly Ala Leu Arg Gly Leu Gly Glu Leu Gln Glu  
 115 120 125

Leu Tyr Leu Lys Gly Asn Glu Leu Lys Thr Leu Pro Pro Gly Leu Leu  
 130 135 140

Thr Pro Thr Pro Lys Leu Glu Lys Leu Ser Leu Ala Asn Asn Asn Leu  
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Thr Glu Leu Pro Ala Gly Leu Leu Asn Gly Leu Glu Asn Leu Asp Thr  
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Leu Leu Leu Gln Glu Asn Ser Leu Tyr Thr Ile Pro Lys Gly Phe Phe  
 180 185 190

Gly Ser His Leu Leu Pro Phe Ala Phe Leu His Gly Asn Pro Trp Leu  
 195 200 205

Cys Asn Cys Glu Ile Leu Tyr Phe Arg Arg Trp Leu Gln Asp Asn Ala  
 210 215 220

Glu Asn Val Tyr Val Trp Lys Gln Gly Val Asp Val Lys Ala Met Thr  
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Ser Asn Val Ala Ser Val Gln Cys Asp Asn Ser Asp Lys Phe Pro Val  
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Tyr Lys Tyr Pro Gly Lys Gly Cys Pro Thr Leu Gly Asp Glu Gly Asp



260

265

270

Thr Asp Leu Tyr Asp Tyr Tyr Pro Glu Glu Asp Thr Glu Gly Asp Lys  
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Thr Pro Trp Gly Leu Phe Tyr Ser Trp Ser Thr Ala Ser Leu Asp Val  
 305 310 315 320

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Gln Trp Asn Gly Gln Pro Ala Glu Asn Tyr Lys Asn Thr Gln Pro Ile  
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Lys Ser Asn Trp Glu Ala Gly Asn Thr Phe Thr Cys Ser Val Leu His  
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35 40 45	
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Cys Val Val Val Asp Val Ser Glu Asp Asp Pro Asp Val Gln Ile Ser	
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Trp Phe Val Asn Asn Val Glu Val His Thr Ala Gln Thr Gln Thr His	
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Arg Glu Asp Tyr Asn Ser Thr Leu Arg Val Val Ser Ala Leu Pro Ile	
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Gly Ser Val Arg Ala Pro Gln Val Tyr Val Leu Pro Pro Pro Glu Glu	
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145 150 155	
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Met Pro Glu Asp Ile Tyr Val Glu Trp Thr Asn Asn Gly Lys Thr Glu	
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Leu Asn Tyr Lys Asn Thr Glu Pro Val Leu Asp Ser Asp Gly Ser Tyr	
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175

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His Pro Ile Cys Glu Val Ser Lys Val Ala Ser His Leu Glu Val Asn	
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tgt gac aag agg aat ctg aca gcg ctg cct cca gac ctg ccg aaa gac	144
Cys Asp Lys Arg Asn Leu Thr Ala Leu Pro Pro Asp Leu Pro Lys Asp	
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Thr Thr Ile Leu His Leu Ser Glu Asn Leu Leu Tyr Thr Phe Ser Leu	
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Ala Thr Leu Met Pro Tyr Thr Arg Leu Thr Gln Leu Asn Leu Asp Arg	
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Cys Glu Leu Thr Lys Leu Gln Val Asp Gly Thr Leu Pro Val Leu Gly	
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Thr Leu Asp Leu Ser His Asn Gln Leu Gln Ser Leu Pro Leu Leu Gly	
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Gln Thr Leu Pro Ala Leu Thr Val Leu Asp Val Ser Phe Asn Arg Leu	
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Leu Leu Leu Gln Glu Asn Ser Leu Tyr Thr Ile Pro Lys Gly Phe Phe	
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ggg tcc cac ctc ctg cct ttt gct ttt ctc cac ggg aac ccc tgg tta	672
Gly Ser His Leu Leu Pro Phe Ala Phe Leu His Gly Asn Pro Trp Leu	
195 200 205	

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gtg cgt gcc aca agg act gtg gtc aag ttc ccc acc aaa gcc cat aca Val Arg Ala Thr Arg Thr Val Val Lys Phe Pro Thr Lys Ala His Thr 290 295 300	960
acc ccc tgg ggt cta ttc tac tca tgg tcc act gct tct cta gac gag Thr Pro Trp Gly Leu Phe Tyr Ser Trp Ser Thr Ala Ser Leu Asp Glu 305 310 315 320	1008
ccc aga ggg ccc aca atc aag ccc tgt cct cca tgc aaa tgc cca gca Pro Arg Gly Pro Thr Ile Lys Pro Cys Pro Pro Cys Lys Cys Pro Ala 325 330 335	1056
cct aac ctc ttg ggt gga cca tcc gtc ttc atc ttc cct cca aag atc Pro Asn Leu Leu Gly Gly Pro Ser Val Phe Ile Phe Pro Pro Lys Ile 340 345 350	1104
aag gat gta ctc atg atc tcc ctg agc ccc ata gtc aca tgt gtg gtg Lys Asp Val Leu Met Ile Ser Leu Ser Pro Ile Val Thr Cys Val Val 355 360 365	1152
gtg gat gtg agc gag gat gac cca gat gtc cag atc agc tgg ttt gtg Val Asp Val Ser Glu Asp Asp Pro Asp Val Gln Ile Ser Trp Phe Val 370 375 380	1200
aac aac gtg gaa gta cac aca gct cag aca caa acc cat aga gag gat Asn Asn Val Glu Val His Thr Ala Gln Thr Gln Thr His Arg Glu Asp 385 390 395 400	1248
tac aac agt act ctc cgg gtg gtc agt gcc ctc ccc atc cag cac cag Tyr Asn Ser Thr Leu Arg Val Val Ser Ala Leu Pro Ile Gln His Gln 405 410 415	1296
gac tgg atg agt ggc aag gag ttc aaa tgc aag gtc aac aac aaa gac Asp Trp Met Ser Gly Lys Glu Phe Lys Cys Lys Val Asn Asn Lys Asp 420 425 430	1344
ctg cca gcg ccc atc gag aga acc atc tca aaa ccc aaa ggg tca gta	1392

Leu	Pro	Ala	Pro	Ile	Glu	Arg	Thr	Ile	Ser	Lys	Pro	Lys	Gly	Ser	Val		
		435					440					445					
aga	gct	cca	cag	gta	tat	gtc	ttg	cct	cca	cca	gaa	gaa	gag	atg	act	1440	
Arg	Ala	Pro	Gln	Val	Tyr	Val	Leu	Pro	Pro	Pro	Glu	Glu	Glu	Met	Thr		
		450				455					460						
aag	aaa	cag	gtc	act	ctg	acc	tgc	atg	gtc	aca	gac	ttc	atg	cct	gaa	1488	
Lys	Lys	Gln	Val	Thr	Leu	Thr	Cys	Met	Val	Thr	Asp	Phe	Met	Pro	Glu		
		465			470				475						480		
gac	att	tac	gtg	gag	tgg	acc	aac	aac	ggg	aaa	aca	gag	cta	aac	tac	1536	
Asp	Ile	Tyr	Val	Glu	Trp	Thr	Asn	Asn	Gly	Lys	Thr	Glu	Leu	Asn	Tyr		
			485						490					495			
aag	aac	act	gaa	cca	gtc	ctg	gac	tct	gat	ggg	tct	tac	ttc	atg	tac	1584	
Lys	Asn	Thr	Glu	Pro	Val	Leu	Asp	Ser	Asp	Gly	Ser	Tyr	Phe	Met	Tyr		
			500					505					510				
agc	aag	ctg	aga	gtg	gaa	aag	aag	aac	tgg	gtg	gaa	aga	aat	agc	tac	1632	
Ser	Lys	Leu	Arg	Val	Glu	Lys	Lys	Asn	Trp	Val	Glu	Arg	Asn	Ser	Tyr		
		515					520					525					
tcc	tgt	tca	gtg	gtc	cac	gag	ggg	ctg	cac	aat	cac	cac	acg	act	aag	1680	
Ser	Cys	Ser	Val	Val	His	Glu	Gly	Leu	His	Asn	His	His	Thr	Thr	Lys		
		530				535					540						
agc	ttc	tcc	cgg	act	ccg	ggg	aaa	tga								1707	
Ser	Phe	Ser	Arg	Thr	Pro	Gly	Lys										
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His	Pro	Ile	Cys	Glu	Val	Ser	Lys	Val	Ala	Ser	His	Leu	Glu	Val	Asn
1			5					10					15		

Cys	Asp	Lys	Arg	Asn	Leu	Thr	Ala	Leu	Pro	Pro	Asp	Leu	Pro	Lys	Asp
	20							25					30		

Thr	Thr	Ile	Leu	His	Leu	Ser	Glu	Asn	Leu	Leu	Tyr	Thr	Phe	Ser	Leu
	35						40				45				



Ala Thr Leu Met Pro Tyr Thr Arg Leu Thr Gln Leu Asn Leu Asp Arg  
50 55 60

Cys Glu Leu Thr Lys Leu Gln Val Asp Gly Thr Leu Pro Val Leu Gly  
65 70 75 80

Thr Leu Asp Leu Ser His Asn Gln Leu Gln Ser Leu Pro Leu Leu Gly  
85 90 95

Gln Thr Leu Pro Ala Leu Thr Val Leu Asp Val Ser Phe Asn Arg Leu  
100 105 110

Thr Ser Leu Pro Leu Gly Ala Leu Arg Gly Leu Gly Glu Leu Gln Glu  
115 120 125

Leu Tyr Leu Lys Gly Asn Glu Leu Lys Thr Leu Pro Pro Gly Leu Leu  
130 135 140

Thr Pro Thr Pro Lys Leu Glu Lys Leu Ser Leu Ala Asn Asn Asn Leu  
145 150 155 160

Thr Glu Leu Pro Ala Gly Leu Leu Asn Gly Leu Glu Asn Leu Asp Thr  
165 170 175

Leu Leu Leu Gln Glu Asn Ser Leu Tyr Thr Ile Pro Lys Gly Phe Phe  
180 185 190

Gly Ser His Leu Leu Pro Phe Ala Phe Leu His Gly Asn Pro Trp Leu  
195 200 205

Cys Asn Cys Glu Ile Leu Tyr Phe Arg Arg Trp Leu Gln Asp Asn Ala  
210 215 220

Glu Asn Val Tyr Val Trp Lys Gln Gly Val Asp Val Lys Ala Met Thr  
225 230 235 240

Ser Asn Val Ala Ser Val Gln Cys Asp Asn Ser Asp Lys Phe Pro Val  
245 250 255

Tyr Lys Tyr Pro Gly Lys Gly Cys Pro Thr Leu Gly Asp Glu Gly Asp  
260 265 270

Thr Asp Leu Tyr Asp Tyr Tyr Pro Glu Glu Asp Thr Glu Gly Asp Lys  
 275 280 285

Val Arg Ala Thr Arg Thr Val Val Lys Phe Pro Thr Lys Ala His Thr  
 290 295 300

Thr Pro Trp Gly Leu Phe Tyr Ser Trp Ser Thr Ala Ser Leu Asp Glu  
 305 310 315 320

Pro Arg Gly Pro Thr Ile Lys Pro Cys Pro Pro Cys Lys Cys Pro Ala  
 325 330 335

Pro Asn Leu Leu Gly Gly Pro Ser Val Phe Ile Phe Pro Pro Lys Ile  
 340 345 350

Lys Asp Val Leu Met Ile Ser Leu Ser Pro Ile Val Thr Cys Val Val  
 355 360 365

Val Asp Val Ser Glu Asp Asp Pro Asp Val Gln Ile Ser Trp Phe Val  
 370 375 380

Asn Asn Val Glu Val His Thr Ala Gln Thr Gln Thr His Arg Glu Asp  
 385 390 395 400

Tyr Asn Ser Thr Leu Arg Val Val Ser Ala Leu Pro Ile Gln His Gln  
 405 410 415

Asp Trp Met Ser Gly Lys Glu Phe Lys Cys Lys Val Asn Asn Lys Asp  
 420 425 430

Leu Pro Ala Pro Ile Glu Arg Thr Ile Ser Lys Pro Lys Gly Ser Val  
 435 440 445

Arg Ala Pro Gln Val Tyr Val Leu Pro Pro Pro Glu Glu Glu Met Thr  
 450 455 460

Lys Lys Gln Val Thr Leu Thr Cys Met Val Thr Asp Phe Met Pro Glu  
 465 470 475 480

Asp Ile Tyr Val Glu Trp Thr Asn Asn Gly Lys Thr Glu Leu Asn Tyr  
 485 490 495

Lys Asn Thr Glu Pro Val Leu Asp Ser Asp Gly Ser Tyr Phe Met Tyr

500

505

510

Ser Lys Leu Arg Val Glu Lys Lys Asn Trp Val Glu Arg Asn Ser Tyr  
515 520 525

Ser Cys Ser Val Val His Glu Gly Leu His Asn His His Thr Thr Lys  
530 535 540

Ser Phe Ser Arg Thr Pro Gly Lys  
545 550